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EXAMINER	
KRONENTHAL, CRAIG W	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/982,177	IKEDA ET AL.	
	Examiner	Art Unit	
	Craig W. Kronenthal	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37,43-47 and 49-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37,43-45,47 and 49-66* is/are rejected.

7)☒ Claim(s) *46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/31/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed March 8, 2005 has been entered and made of record.

2. The objections to claims 1-11, 13-15, 29-31, and 36 are withdrawn in view of the amendment.

3. Objection to claims 7, 12, 22, 23, and 34 as allowable subject matter is withdrawn and rejections of these claims have been made.

Response to Arguments

4. Applicant's arguments with respect to claims 1-3, 8-11, 13-18, 24-30, 32, 33, 35-37, 50, 51, 54-56, 59, and 61-66 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

5. Claims 7 and 22 are objected to because of the following informalities:

- On line 5 of claims 7 and 22, an "ordinary image" is referred to but not recited in the specification. Examiner believes the applicant may have intended to use "original image" instead.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3, 8-11, 13-18, 24-30, 32, 33, 35-37, 50, 51, 54-56, 59, and 61-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox et al. (PN 6,154,571) in view of Rhoads (PN 6,285,776). (hereinafter Cox and Rhoads respectively).

Regarding Claim 1: Cox discloses a data processing system including an image processing apparatus (adders, Fig. 3, 52 and 64) for processing an image and a maintenance apparatus (watermark correction device, Fig. 3, 62) for setting a processing function of said image processing apparatus (52), said maintenance apparatus (62) connected with said image processing apparatus through a network (all arrows in Fig. 3), wherein

- Said maintenance apparatus (62) receives an addition level of anti-forgery information (Fig. 3, output of 60), formed on a print medium by said image processing apparatus (52), and transmits an appropriate anti-forgery information addition level (Fig. 3, output of 62) to the image processing apparatus (64) based on the received addition level (output of 60). The image processing apparatus, which is represented by the adder (52) initially adds a watermark to DCT

coefficients, which are derived from a print medium such as an input image (col. 9 lines 52-54). The watermark correction device (62) acts as the maintenance apparatus to calculate a more appropriate addition level and outputs this level back to another adder (64) belonging to the image processing apparatus (col. 10 lines 55-58).

- Said image processing apparatus (52, 64) adds anti-forgery information (watermark correction signals, Fig. 3, output of 62), having the transmitted [appropriate] addition level, to an image (Fig. 3, output of 36) (col. 10 lines 5-6). The quantizer (36) outputs quantization values representing an input image to be superimposed by an adder (64) with watermark information set at an appropriate addition level determined by watermark correction device (62).

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 2: Cox also discloses the data processing system according to claim 1, wherein said maintenance apparatus (Fig. 3, 62) determines the appropriate anti-forgery information addition level based on a test pattern transmitted by said image processing apparatus (DCT calculator, Fig. 3, 56). The DCT calculator (56) is also part of the image processing system. It outputs DCT coefficients used as a test pattern for determining Vr[k] in step 502 (Fig. 5) of the watermark correction device (62).

Regarding Claim 3: Cox discloses a data processing system including an image processing apparatus for processing an image and a maintenance apparatus for setting a processing function of said image processing apparatus, said maintenance apparatus connected with said image processing apparatus through a network, wherein said image processing apparatus comprises:

- Image forming means (Fig. 3, 52) for forming an image to which anti-forgery information (Fig. 3, watermark) is added at a predetermined addition level. It is well known in the art that watermarks are used as anti-forgery information or copy control and management as referred to by Cox (col. 1 lines 30-35). Cox also explains that a user may wish to select a predetermined addition level for the first addition of a watermark into an image sequence (col. 9 lines 7-10).
- Reading means (Fig. 3, 54) for reading the image formed by said image forming means (image sequence) (col. 9 lines 54-56).

- Transmission means (Fig. 3, 36) for transmitting image data (Fig. 3, output of 36), read by said reading means (54), to said maintenance apparatus (Fig. 3, 58) through the network (Fig. 3, all arrows) (col. 9 lines 63-65). The inverse quantizer (58) is considered part of the maintenance apparatus and receives image data, specifically quantization values from the quantizer (36) belonging to the image processing apparatus.

said maintenance apparatus comprises:

- Reception means (Fig. 3, 58) for receiving the image data (Fig. 3, output of 36) transmitted by said transmission means (36) of said image processing apparatus (col. 9 lines 63-65). The inverse quantizer (58) receives the image data before it begins its processing.
- Setting means (62) determining an addition level appropriate for said image processing apparatus based on the image data received (Fig. 3, output of 36) by said reception means (58), and setting the image processing apparatus to use the determined addition level (Fig. 3, 64). The watermark correction device (62) sets an appropriate addition level in step 504 (Fig. 5) based on the absolute value Dif and the sign s, which are based on the image data received (col. 10 lines 45-49). The flow chart for the setting means is shown in Figure 5. The output of the watermark correction device (62) are watermark signals with the appropriate addition level applied.
- Wherein said image forming means (64) adds anti-forgery information, having the addition level set by said setting means (62), to the image (output of 36). The

adder (64) has the same functionality as the adder (52) and both are considered part of the image processing apparatus.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claims 8 and 25: Cox discloses the data processing system according to claim 3, said setting means of said maintenance apparatus further comprising:

- Determination means (Fig. 3, 62) for determining an addition level appropriate for said image processing apparatus based on the image data received by said reception means (Fig. 3, 58). The watermark correction device (62) sets an appropriate addition level in step 504 (Fig. 5) based on the absolute value Dif and the sign s, which are based on the image data received (col. 10 lines 45-49). The flow chart for the setting means is shown in Figure 5. The output of the

watermark correction device (62) are watermark signals with the appropriate addition level applied.

- Transmission means (Fig. 3, 62) for transmitting the addition level, determined by said determination means (62), to said image processing apparatus (Fig. 3, 64) (col. 10 lines 3-6).

Regarding Claims 9 and 26: Cox discloses the data processing system according to claim 8, wherein said determination means (Fig. 3, 62) obtains as the addition level appropriate for said image processing apparatus, a level at which anti-forgery information is readable based on the image data received by said reception means (Fig. 3, 58) (col. 12 lines 17-18). The term readable is satisfied by any manner in which the meaning of the anti-forgery information is grasped. Therefore, it is sufficient to show that the watermark can be detected. Figure 8 shows the detection method for reading a watermark from an image. Since the watermark is readable from the image then it must be inserted at an appropriate addition level that allows it to be read.

Regarding Claims 10 and 27: Cox discloses the data processing system according to claim 9, wherein said determination means (Fig. 3, 62) of said maintenance apparatus comprises storage means (Fig. 3, 32) for storing reference data used for determining the addition level, and determines the addition level based on the reference data and the image data received by said reception means (Fig. 3, 58). The frame memory (32) stores predicted images. The predicted images act as reference data and are used by

a DCT calculator (Fig. 3, 56) to calculate DCT coefficients. These coefficients are added to the output of the inverse quantizer (58), which is based on image data (col. 9 lines 65-67). This summation is used for determining the watermark correction signals having the appropriate addition level by watermark correction device (62).

Regarding Claims 11 and 28: Cox discloses the data processing system according to claim 10, wherein said determination means (Fig. 3, 62) performs calculation on the image data received by said reception means (Fig. 3, 58) and the reference data (predicted images) to determine an addition level which satisfies a predetermined condition (col. 11 lines 15-17). The explanation regarding claim 10 outlines how the determination means (62) uses image data and reference data to determine an addition level. Cox discloses these limitations, as well as, the checking of the addition level with a predetermined condition. This check is done in step 526 (Figs. 6 and 7) where Dif is compared with the predetermined zero and j is compared with the predetermined n_k.

Regarding Claim 13: Cox discloses a data processing system including an image processing apparatus for processing an image and a maintenance apparatus for setting a processing function of said image processing apparatus, said maintenance apparatus connected with said image processing apparatus through a network, wherein said image processing apparatus comprises:

- Image forming means (Fig. 3, 52) for forming an image, inclusive of anti-forgery information in a plurality of addition levels (col. 6 lines 38-41 and 62-63). Cox

defines the term "slack" which acts as a maximum addition level. Cox also explains that this value may be different for different 8x8 DCT's within a single image and therefore Cox is disclosing the use of multiple addition levels.

- Reading means (Fig. 3, 54) for reading the image formed by said image forming means (image sequence) (col. 9 lines 54-56).
- Transmission means (Fig. 3, 36) for transmitting the image (Fig. 3, output of 36), read by said reading means (54), to said maintenance apparatus (Fig. 3, 58) through the network (Fig. 3, all arrows) (col. 9 lines 63-65). The inverse quantizer (58) is considered part of the maintenance apparatus and receives image data, specifically quantization values from the quantizer (36) belonging to the image processing apparatus.

said maintenance apparatus comprises:

- Reception means (Fig. 3, 58) for receiving the image data (Fig. 3, output of 36) transmitted by said transmission means (36) of said image processing apparatus (col. 9 lines 63-65). The inverse quantizer (58) receives the image data before it begins its processing.
- Setting means (62) for selecting an addition level appropriate for said image processing apparatus based on the image data received (Fig. 3, output of 36) by said reception means (58), and setting the image processing apparatus to use the selected addition level (Fig. 3, 64). The watermark correction device (62) sets an appropriate addition level in step 504 (Fig. 5) based on the absolute value Dif and the sign s, which are based on the image data received (col. 10

lines 45-49). The flow chart for the setting means is shown in Figure 5. The output of the watermark correction device (62) are watermark signals with the appropriate addition level applied.

- Wherein said image forming means (64) adds anti-forgery information, having the addition level set by said setting means (62), to an image (output of 36). The adder (64) has the same functionality as the adder (52) and both are considered part of the image processing apparatus.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 14: Cox discloses the data processing system according to claim 13, comprising, in place of said image forming means, image forming means for forming an image inclusive of plural types of anti-forgery information (col. 1 lines 30-35). The plural types of anti-forgery information may all be copyright ownership, which encompasses

the title, copyright date, and author. In addition to copyright ownership, Cox discloses that the anti-forgery information may just be coded signal, which may just be a message indicating the data should not be copied.

Regarding Claim 15: Cox discloses the data processing system according to claim 13, comprising, in place of said image forming means, image forming means for forming an image inclusive of n x m (n and m are natural numbers) anti-forgery information, consisting of n number of anti-forgery information in m number of addition levels. Refer to the analogous arguments made in claims 13 and 14. The plural types of copyright ownership described regarding claim 14, may be located in different DCT blocks. It is also possible that these DCT blocks have different slacks as explained in the analogous argument regarding claim 13. Therefore, plural anti-forgery information may exist at plural addition levels within the same image.

Regarding Claims 16 and 32: Cox discloses an image processing apparatus maintained by an externally connected maintenance apparatus, comprising:

- Report means (Fig. 3, 60) for reporting information related to deterioration of said image processing apparatus (col. 9 line 67-col. 10 line 3). The adder (60) reports information that is deteriorated by the image processing apparatus. The information is reported to the watermark correction device (62).
- Addition means (Fig. 3, 64) for adding anti-forgery information (Fig. 3, output of 62), having an addition level which is determined based on instruction data

transmitted by said maintenance apparatus (62) in response to the report, to an image (col. 10 lines 5-6). The adder (64) adds the anti-forgery information with a determined addition level (output of 62) to the image (output of 36).

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claims 17 and 33: Cox discloses the image processing apparatus according to claim 16, wherein said report means (Fig. 3, 60) transmits, as the information related to deterioration, a test pattern inclusive of anti-forgery information to said maintenance apparatus (Fig. 3, 62) (col. 9 line 67-col. 10 line 3). The adder (60) outputs DCT coefficients for decoded images which means the DCT coefficients represent deteriorated anti-forgery information. These DCT coefficients also satisfy the condition of a test pattern.

Regarding Claim 18: Cox discloses an image processing apparatus connected to an external maintenance apparatus, comprising:

- The addition means is rejected for reasons given in the analogous argument made regarding the image forming means of claim 3.
- Output means for outputting the image (col. 8 line 63). The result is a watermarked image.
- The reading means is rejected for reasons given in the analogous argument made regarding the reading means of claim 3.
- The transfer means is rejected for reasons given in the analogous argument made regarding the transfer means of claim 3.
- The reception means is rejected for reasons given in the analogous argument made regarding the reception means and setting means of claim 3.
- The addition means is rejected for reasons given in the analogous argument made regarding the image forming means of claim 3.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image

(col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 24: Cox discloses a maintenance apparatus for maintaining an image processing apparatus which forms an image inclusive of anti-forgery information, comprising:

- The determination means and setting means are rejected for reasons given in the analogous argument made regarding the maintenance apparatus of claim 3 comprising a reception means and setting means.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 29: Cox discloses an image processing apparatus setting method of setting an anti-forgery information level for an image processing apparatus forming an image inclusive of anti-forgery information, comprising the steps of:

- Checking deterioration of the image processing apparatus (col. 10 lines 31-34 and 45-47). The Dif value is a value corresponding to the deterioration as a result of image processing apparatus. Step 504 in the flow chart in Figure 5 represents this step.
- Determining an anti-forgery information addition level appropriate for the image processing apparatus based on a checking result obtained at said checking step (col. 10 lines 48-49). The watermark having anti-forgery information with an appropriate addition level is determined in step 506 of Figure 5. This determination is based on the checking result from step 504 as demonstrated by the arrow directly connecting step 504 to step 506.
- Setting the image processing apparatus to use the addition level determined at said determination step (col. 10 lines 55-58). The watermark correction signals which represent the anti-forgery information having the appropriate addition level are sent to the adder (64) belonging to the image processing apparatus.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-

forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 30: Cox discloses the image processing apparatus setting method according to claim 29, further comprising the step of:

- Receiving a test pattern transmitted by the image processing apparatus (col. 10 lines 19-21). The Dr_k[I] is a test pattern input into the watermark correction device (62) from the adder (60)
- Wherein at said checking step, a deterioration level of the image processing apparatus is checked based on the test pattern (col. 10 lines 19-21). The output of adder (60), which is the test pattern, is used in the checking step to compute Vr[1...N] which is in turn used to calculate the Dif value. Therefore, it can be said that the checking step checks the deterioration level based on a test pattern.

Regarding Claim 35: Refer to the analogous arguments made regarding claim 29 for the checking and determining steps. With respect to the checking step, Cox also discloses the image processing apparatus forming an image inclusive of anti-forgery information as argued in regards to claim 1. Refer to the analogous argument made regarding claim 8 for the transmitting step.

Regarding Claim 36: Refer to the analogous arguments made regarding claim 10 corresponding to the steps of receiving and determining. Claim 10 also includes the limitations of claim 3. Refer to the analogous arguments made regarding claim 3 corresponding to the step of setting the second addition level.

Regarding Claim 37: Refer to the analogous arguments made regarding claim 16 explaining the steps of reporting, receiving, and adding.

Regarding Claim 50: Cox discloses an image processing apparatus for adding visually inconspicuous information to an image, comprising:

- Reception means for receiving information from a maintenance apparatus in order to further add, in addition to the information, visually inconspicuous information (col. 10 lines 5-6). The adder (64) is a reception means since it receives the outputs of the maintenance apparatus called the watermark correction device (62).
- Processing means for adding information to be added to the image using the received information (col. 10 lines 5-6). The adder (64) is also the processing means for adding the watermark corrected signals in a manner so that they are visually inconspicuous (col. 6 lines 9-13). The adder (64) changes the values of the quantized DCT coefficients received by quantizer (36) in accordance with the received watermark corrected signals.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Regarding Claim 52: Cox discloses the image processing apparatus according to claim 50, further comprising inquiry means for inquiring whether or not the maintenance apparatus has additional information to be added to the image. It is obvious that the image processing apparatus could inquire the maintenance apparatus as part of the process of receiving notification that the corrected information is available (col. lines 55-58). The adder (64) is given notification to add information with corrected addition level to an image once the watermark process (Fig. 5) is finished. It would be obvious to one of ordinary skill in the art that this inquiry procedure be added to synchronize the process of combining the image data with the anti-forgery information having a corrected addition level. One would be motivated to make this modification to prevent

adding the corrected anti-forgery information to the wrong image data. This is particularly of importance when the image data is rapidly input as in a video.

Regarding Claims 53: Cox discloses the image processing apparatus according to claim 52, wherein the inquiry is made at the time of turning on the power of the image processing apparatus. It is inherent that these electrical components be supplied with a power source and that they are immediately operable once power is available. Therefore, the inquiry, which is an obvious expansion of the operation of the image processing apparatus' adder (64), would occur at the time the adder (64) received power.

Regarding Claim 54: Cox discloses the image processing apparatus according to claim 50, wherein the information to be added includes date information, information regarding an apparatus used to pick up or input the image, copyright information of the image, or setting information of an apparatus used to pick up/input/form the image (col. 5 lines 29-31). The image processing apparatus adds watermarks, which are defined as any identifying information. Date information, information regarding an apparatus used to pick up or input the image, copyright information of the image, and setting information of an apparatus used to pick up/input/form the image are all types of identifying information.

Regarding Claims 55 and 62: The arguments made with regards to claim 1 are applicable to the limitations of this claim as well. The newly designating information may be the anti-forgery information having a corrected addition level (Fig. 3, output of 62). Also the information added to the image is added by a visually inconspicuous method (col. 6 lines 38-41). The "slack" is calculated so that the information added is imperceptible throughout the image.

Regarding Claim 57: Cox discloses the apparatus according to claim 55, wherein said transmission means transmits the information to be added in response to an inquiry from the image processing apparatus. It is obvious that the image processing apparatus could inquire the maintenance apparatus as part of the process of receiving notification that the corrected information is available (col. lines 55-58). The adder (64) is given notification to add information with corrected addition level to an image once the watermark process (Fig. 5) is finished. In addition it would be obvious that for the maintenance apparatus to transmit information in response to the inquiry. Furthermore, it would be obvious to one of ordinary skill in the art that this inquiry and accompanying response procedure be added to synchronize the process of combining the image data with the anti-forgery information having a corrected addition level. One would be motivated to make this modification to prevent adding the corrected anti-forgery information to the wrong image data. This is particularly of importance when the image data is rapidly input as in a video.

Regarding Claim 58: Refer to analogous arguments made regarding claim 53. These arguments can be made for the limitations of the maintenance apparatus disclosed in claim 57.

Regarding Claim 59: Refer to analogous arguments made regarding claim 54. These arguments can be made for the limitations of the maintenance apparatus disclosed in claim 55.

Regarding Claim 60: Official notice is taken that it is obvious for the transmission means of the apparatus of claim 55 to transmit the information to a plurality of image processing apparatuses including said image processing apparatus. It would be obvious to one of ordinary skill in the art to create multiple outputs to a plurality of image processing apparatuses because copies are often made multiple times. Furthermore, one would be motivated to make this modification to save time making copies simultaneously rather than in sequence.

Regarding Claim 61: Refer to analogous arguments made regarding claim 1. Also the information added to the image is added by a visually inconspicuous method (col. 6 lines 38-41). The "slack" is calculated so that the information added is imperceptible throughout the image. The image processing apparatus receives and adds image information and visually inconspicuous anti-forgery information.

Regarding Claims 63: Refer to analogous arguments made regarding claim 1. The processing ability of the image processing apparatus is gauged by the received addition level. This addition level is used to compute the Dif value, which quantifies the deterioration of the image processing apparatus represented by adder (52) and the quantizing process (col. 10 lines 45-47).

Regarding Claims 64: Refer to the analogous arguments made regarding claim 2.

Regarding Claim 65: Refer to the analogous arguments made regarding claim 63. The processing ability is understood to be the degree of degradation.

Regarding Claim 66: Refer to the analogous arguments made regarding claim 64. The processing ability is understood to be the degree of degradation.

8. Claims 4, 5, 6, 12, 19, 20, 21, 23, 31, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox and Rhoads in view of Ogino et al. (PN 6,359,905). (hereinafter Ogino)

Regarding Claims 4 and 19: Cox as modified by Rhoads discloses the data processing system according to claim 3, but does not disclose an addition level storage means. However, Ogino does disclose an image processing apparatus further comprising:

- Addition level storage means (Fig. 2, 24) for storing the addition level (Fig. 2, FS) (col. 5 lines 63-67), wherein said image forming means (Fig. 2, 20) adds anti-forgery information to the image (Fig. 2, Vi) at the addition level (FS), stored in said addition level storage means (24), and forms an image (contents of record medium, Fig. 2, 27). The additional information generating unit (24) has a means for storing the additional information signal FS, which is disclosed as being copying preventive control information and/or a copying preventive signal such as copyright information (col. 6 lines 1-6). The copying preventive control information reads on the addition level, since the addition level controls a characteristic of the additional information. The image forming means combines the anti-forgery information at the addition level (FS) to the input image (Vi) at the superimposing unit (Fig. 2, 22), which then outputs the resulting image to be stored in the record medium (27). It would have been obvious for one of ordinary skill in the art to modify Cox with the addition level storage means of Ogino because both references disclose an image processing apparatus adding a watermark. Furthermore, Cox explains that the addition level maximum would be set through a user interface and an algorithm would be used to automatically set the watermark to an allowable strength (col. 9 lines 7-19). It is obvious that a storage means can be used in conjunction with this algorithm to store the allowable addition levels. One would be motivated to make this modification because Ogino offers the advantage of choosing from multiple addition levels, which could avoid having to rely on a manual decision as Cox suggests.

Regarding Claims 5 and 20: Cox as modified by Rhoads in view of Ogino discloses the data processing system according to claim 4. Cox incorporating Cox (PN 5,915,027) discloses the image processing apparatus further comprising:

- Test pattern storage means (PN mapper, Fig. 1, 11) for storing a test pattern (PN sequence), wherein said image forming means adds anti-forgery information to the test pattern (PN sequence), stored in said test pattern storage means (11), and forms an image (col. 6 lines 29-31). The PN mapper (11) contains a database for storing the PN sequence information. The PN sequence is used as a test pattern for embedding watermark data (col. 4 lines 45-48).

Regarding Claims 6 and 21: Cox as modified by Rhoads and incorporating Cox (PN 5,915,027) in view of Ogino discloses the data processing system according to claim 5. Ogino further discloses an image processing apparatus further comprising:

- Anti-forgery information storage means (Fig. 2, 24) for storing anti-forgery information (Fig. 2, FS), wherein said image forming means (Fig. 2, 20) adds anti-forgery information (FS), stored in said anti-forgery information storage means (24), to the test pattern (Fig. 4, PS) and forms an image (contents of record medium, Fig. 2, 27). The additional information generating unit (24) has a means for storing the additional information signal FS, which is disclosed as being copying preventive control information and/or a copying preventive signal such as copyright information (col. 6 lines 1-6). The copying preventive signal

reads on the anti-forgery information. The image forming means (20) contains a multiplying unit (Fig. 4, 252) for adding the anti-forgery information (FS) to the test pattern (PS) (col. 7 lines 4-6). The image forming means (20) also forms an image (contents of record medium, 27) by combining the anti-forgery information added to the test pattern (SF) with an input image (Vi) at the superimposing unit (Fig. 2, 22). It would have been obvious to one of ordinary skill in the art to modify Cox with the anti-forgery information storage means because both references teach watermark embedding using test patterns. One would be motivated to make this modification to allow the anti-forgery information to be embedded automatically as opposed to being entered each time the information is embedded. It is common practice to repeatedly embed the same information in multiple frames or areas of an image.

Regarding Claims 12, 23, and 34: Cox as modified by Rhoads in view of Ogino discloses the data processing system according to claim 5. Cox incorporating Cox (PN 5,915,027) discloses the anti-forgery information added to the test pattern being embedded data, symbols, images, or instructions (col. 5 lines 29-31), whereas Rhoads discloses the anti-forgery information added to an ordinary image being a change in line width (col. 3 lines 48-53).

Regarding Claim 31: All of the limitations of claim 31 are explained in analogous arguments made in claim 5, which includes the arguments made in claim 3. Note that

the first addition level stated in claim 31 corresponds to the predetermined addition level of claim 3.

9. Claims 7 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Cox and Rhoads in view of Ogino and further in view of Rao et al. (PN 6,222,932). (hereinafter Rao)

Regarding Claims 7 and 22: The combination of Cox and Rhoads as modified by Ogino discloses the data processing system according to claim 5, said image processing apparatus further comprising:

- Anti-forgery information storage means for storing first anti-forgery information to be added to a test pattern [Ogino discloses a storing unit that is provided to the additional information generating unit (Figure 2, item 24) for storing the additional information signal FS (col. 5 line 63 – col. 6 line 6), to be added to a PN code series to perform spectrum spreading by the SS signal forming unit (Figure 2, 25) (col. 6 lines 31-34).].

The combination of Cox and Rhoads as modified by Ogino does not disclose the anti-forgery information storage means for storing a second anti-forgery information and consequently does not disclose the selection means. However, Rao discloses a method of watermarking comprising:

- Anti-forgery information storage means for storing second anti-forgery information to be added to an ordinary image [The stamping database (Figure 1, item 111) stores watermark images well known to act as anti-forgery information (col. 4 lines 63-65).];
- Selection means for selecting one anti-forgery information from a plurality of anti-forgery information stored in said anti-forgery information storage means [A selection of watermark images are stored (col. 4 line 64).],
- Wherein said image forming means adds the anti-forgery information, selected by said selection means, to an image for image formation [The image stamping processor (Figure 1, item 103) applies the watermark images to the image (col. 5 lines 1-4).].

It would have been obvious to one of ordinary skill in the art to add an anti-forgery information storage means for storing a second anti-forgery information and a selection means taught by Rao, to the combination of Cox and Rhoads as modified by Ogino. One would be motivated to make this modification because Rao teaches the value of stored watermark images to deter unscrupulous use (col. 1 lines 19-25). Furthermore, Rao explains that the use of multiple stored watermarks is one reason for creating a system that automatically adjusts the strength of watermarks (col. 1 lines 39-46).

10. Claims 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox and Rhoads in view of Hirai (US 2001/0019659 A1).

Regarding Claim 43: Cox as modified by Rhoads discloses a maintenance apparatus comprising:

- Reception means for receiving addition level information of information to be added to an image by an image forming apparatus. Refer to the analogous arguments made regarding claim 3, corresponding to the reception means and image forming means.
- Transmission means for transmitting the notification to the image processing apparatus. Refer to analogous arguments made regarding claim 8, corresponding to the transmission means.

Cox does not disclose the anti-forgery information being an electrophotographic toner image. However, Rhoads teaches that a watermark, which contains anti-forgery information, can be applied to multiple different forms including an electrophotographic toner image such as a banknote (col. 2 lines 15-21). It would have been obvious to one of ordinary skill in the art to modify Cox's digital watermarking teachings to utilize anti-forgery information in the form of an electrophotographic toner image by using a scanner to convert the toner image into a digital signal. Furthermore, Rhoads suggests using a scanner to digitally encode and/or decode an electrophotographic toner image (col. 2 lines 46-55). Still furthermore, Rhoads teaches "tweaking" an electrophotographic toner image (col. 3 line 61 - col. 4 line 13).

Furthermore, Cox does not disclose:

- Receiving date information

- Determining a date based on the received information for notifying the image forming apparatus to make corrections and transmitting the notification on the determined date

However, Hirai discloses:

- Receiving date information (p. 5, [0072], line 11). The disclosed method must have a means to receive this predetermined time. The predetermined time is date information.
- Determining a date for notifying the image forming apparatus to make corrections and transmitting the notification on the determined date (p. 5, [0072], lines 10-14). The disclosed method uses the received predetermined time/date to determine whether the time/date is elapsed. The result of this determination (elapsed or not elapsed) determines whether the notification is to be sent. If the time/date is reached then the notification is sent (recording is allowed).

It would be obvious to one of ordinary skill in the art to modify the combination of Cox and Rhoads with Hirai because it is well known that watermarks deteriorate over time and that watermarks are used to prevent copying. One would be motivated to make this modification to strengthen a deteriorated watermark after a certain period of time to ensure that the copyright information remains protected.

Regarding Claim 44: Cox discloses the image processing apparatus according to claim 43, wherein the information added to the image is added by a visually inconspicuous

method (col. 6 lines 38-41). The "slack" is calculated so that the information added is imperceptible throughout the image.

Regarding Claim 45: Cox discloses the image processing apparatus according to claim 43, wherein the addition level varies in correspondence with deterioration of the image processing apparatus (col. 10 lines 48-49). The watermark correction signals which have the corrected addition levels vary because they are calculated using Dif, which is a value representing the deterioration of the image processing apparatus.

11. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cox and Rhoads in view of Hirai as applied to claim 43 above, and further in view of Sasich et al. (PN 6,661,904). (hereinafter Sasich)

Regarding Claim 47: The combination of Cox and Rhoads as modified by Hirai discloses the maintenance apparatus according to claim 43, but does not disclose storing an addition level, date, or machine number. However, Sasich discloses the storage of an addition level (logo level sent) and date information (time and/or date) to be added to an image in association with a machine number (transaction server address) (col. 12 lines 39-46). It would be obvious to one of ordinary skill in the art to add the functions integration object (Fig. 6, 134) to Cox's circuitry when multiple image

forming apparatuses are used. One would be motivated to make this modification because each image forming apparatus yield different levels of deterioration.

12. Claims 51 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox and Rhoads, as applied to claims 50 and 55 above, and further in view of Nakagawa et al. (PN 6,104,826). (hereinafter Nakagawa)

Regarding Claims 51 and 56: Cox as modified by Rhoads discloses the apparatus of claim 50 receiving information from a maintenance apparatus in order to further add visually inconspicuous information. Cox as modified by Rhoads does not disclose this information being a program. However, Nakagawa discloses a method of watermark embedding comprising receiving information including a program (Figure 2, item 31) for acquiring information to be added to an image (col. 10 lines 37-50). The CPU (Figure 2, item 1) receives the identification information watermark embedding program (31), which acquires information to be added to an image. It would have been obvious to one of ordinary skill in the art to modify Cox's adder (64) to receive a program as taught by Nakagawa. Furthermore, one would have been motivated to make this modification because the program is used to embed watermarks into picture data without deteriorating the picture quality (col. 2 lines 35-38). The analogous arguments made regarding claim 51 are applicable to claim 56.

Allowable Subject Matter

13. Claim 46 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig W. Kronenthal whose telephone number is (571) 272-7422. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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8/8/05
CWK

JINGGE WU
PRIMARY EXAMINER